Grade 4
Mathematics

Released Items

Winter 2002

Item 13

13 Callie and her brother are taking a bus to visit their grandfather on Saturday. They have the weekday schedule below.

Callie remembers that on weekends:
- there are no even-numbered busses.
- busses leave 20 minutes later than on weekdays.

Oak Street Bus Schedule

Monday-Friday	
Bus Number	Departure Time
#1	6:30 a.m.
#2	7:50 a.m.
#3	9:10 a.m.
#4	10:30 a.m.
#5	11:50 a.m.
#6	1:10 p.m.
#7	2:30 p.m.
#8	3:50 p.m.

What are all of the times the bus will leave on Saturday?

Explain how you found your answers, including how you used the patterns Callie remembered.

Item 13: Scoring Rubric

MEAP Grade 4 Math 2002
Item # 13 Rubric

A **4-point** response does both of the following:

- Correctly determines the Saturday departure times (6:50, 9:30, 12:10, 2:50) by eliminating the even-numbered times and adding 20 minutes to the odd-numbered times. (Note: Ignore a.m. and p.m.)
- Provides a complete and correct explanation of how the Saturday departure times were determined.

A **3-point** response may do one of the following or similar:

- Correctly determines the Saturday departure times, but only provides a partially complete or partially correct explanation.
- One or more bus times are incorrect due to one minor error (which may be repeated, e.g. subtracts 20 minutes instead of adding or eliminates odd-numbered buses instead of even). No other errors are present, and a complete explanation is provided.

A **2-point** response may do one of the following or similar:

- Correctly eliminates even-numbered bus times with appropriate explanation OR correctly adds 20 minutes to bus times with appropriate explanation.
- Correctly determines the Saturday departure times but either provides an incorrect explanation or fails to provide an explanation.

A **1-point** response may do one of the following or similar:

- Shows some understanding of how to use the patterns to solve the problems, but makes significant errors or the work is incomplete.
- Correctly eliminates even-numbered bus times without appropriate explanation OR correctly adds 20 minutes to bus times without appropriate explanation.
- Subtracts 20 minutes from bus times with appropriate explanation OR eliminates odd-numbered bus times with appropriate explanation.

A **0-point** response shows little or no understanding of the problem.

Item 13: Student Response 1

Callie and her brother are taking a bus to visit their grandfather on Saturday. They have the weekday schedule below.

Callie remembers that on weekends:
- there are no even-numbered busses.
- busses leave 20 minutes later than on weekdays.

Oak Street Bus Schedule

Monday-Friday	
Bus Number	Departure Time
#1	6:30 a.m.
#2	7:50 a.m.
#3	9:10 a.m.
#4	10:30 a.m.
#5	11:50 a.m.
#6	1:10 p.m.
#7	2:30 p.m.
#8	3:50 p.m.

What are all of the times the bus will leave on Saturday?

6:50 am. - 9:30 am. - 12:10 pm. - 2:50 pm.

Explain how you found your answers, including how you used the patterns Callie remembered.

Well, it says that there are no even number busses on weekends, so you only need to add 20 minutes to the 1st, 3rd, 5th, and 7th bus.

Score Point: 4

This response correctly determines all 4 Saturday departure times by eliminating even-numbered times and adding 20 minutes to odd-numbered times, and provides a complete and correct explanation.

Item 13: Student Response 2

Callie and her brother are taking a bus to visit their grandfather on Saturday. They have the weekday schedule below.

Callie remembers that on weekends:
- there are no even-numbered busses.
- busses leave 20 minutes later than on weekdays.

Oak Street Bus Schedule

Monday-Friday	
Bus Number	Departure Time
#1	6:30 a.m.
~~#2~~	7:50 a.m.
#3	9:10 a.m.
~~#4~~	10:30 a.m.
#5	11:50 a.m.
~~#6~~	1:10 p.m.
#7	2:30 p.m.
~~#8~~	3:50 p.m.

What are all of the times the bus will leave on Saturday?

6:50 am
9:30am
12:10pm
2:50pm

Explain how you found your answers, including how you used the patterns Callie remembered.

I added 20 mins. to every odd numbered bus on the schedule.

Score Point: 4

This response correctly adds 20 minutes to only odd-numbered departure times, and provides a complete and correct explanation.

Item 13: Student Response 3

Callie and her brother are taking a bus to visit their grandfather on Saturday. They have the weekday schedule below.

Callie remembers that on weekends:
- there are no even-numbered busses.
- busses leave 20 minutes later than on weekdays.

Oak Street Bus Schedule

Monday-Friday	
Bus Number	Departure Time
#1	6:30 a.m.
#2	7:50 a.m.
#3	9:10 a.m.
#4	10:30 a.m.
#5	11:50 a.m.
#6	1:10 p.m.
#7	2:30 p.m.
#8	3:50 p.m.

What are all of the times the bus will leave on Saturday?

8:10 and 10:50 am : 1:30 p.m. 4:10 pm.

Explain how you found your answers, including how you used the patterns Callie remembered.

first, I got rid of all the odd numbers because callie said that there was no odd number busses on weekends. Then I added twenty to the all of the even numbers

Score Point: 3

This response includes one minor error by adding 20 minutes to even (rather than odd) departure times with an acceptable explanation of the process.

Item 13: Student Response 4

Callie and her brother are taking a bus to visit their grandfather on Saturday. They have the weekday schedule below.

Callie remembers that on weekends:
- there are no even-numbered busses.
- busses leave 20 minutes later than on weekdays.

Oak Street Bus Schedule

Monday-Friday	
Bus Number	Departure Time
#1	6:30 a.m.
#2	7:50 a.m.
#3	9:10 a.m.
#4	10:30 a.m.
#5	11:50 a.m.
#6	1:10 p.m.
#7	2:30 p.m.
#8	3:50 p.m.

What are all of the times the bus will leave on Saturday?

6:50 a.m., 8:10 a.m., 9:30 a.m., 10:50 a.m., 12:10 a.m., 1:30 p.m., 2:50 p.m., 4:10 p.m.

Explain how you found your answers, including how you used the patterns Callie remembered.

I added 20 minuts to each bus through Monday and Friday.

Score Point: 2

This response correctly adds 20 minutes to all departure times with an acceptable explanation.

Item 13: Student Response 5

Callie and her brother are taking a bus to visit their grandfather on Saturday. They have the weekday schedule below.

Callie remembers that on weekends:
- there are no even-numbered busses.
- busses leave 20 minutes later than on weekdays.

Oak Street Bus Schedule

Monday-Friday	
Bus Number	Departure Time
#1	6:30 a.m.
#2	7:50 a.m.
#3	9:10 a.m.
#4	10:30 a.m.
#5	11:50 a.m.
#6	1:10 p.m.
#7	2:30 p.m.
#8	3:50 p.m.

What are all of the times the bus will leave on Saturday?

#1, #3, #5, #7

Explain how you found your answers, including how you used the patterns Callie remembered.

IF I know 1 is an odd number I know 2 is even and 3 is odd and 4 is even. ext.

Score Point: 1

This response eliminates the even numbers (#1, #3, etc.) and the explanation is acceptable (If I know 1 is an odd number I know 2 is even), but the work is incomplete.

Item 13: Student Response 6

Callie and her brother are taking a bus to visit their grandfather on Saturday. They have the weekday schedule below.

Callie remembers that on weekends:
- there are no even-numbered busses.
- busses leave 20 minutes later than on weekdays.

Oak Street Bus Schedule

Monday-Friday	
Bus Number	Departure Time
#1	6:30 a.m.
#2	7:50 a.m.
#3	9:10 a.m.
#4	10:30 a.m.
#5	11:50 a.m.
#6	1:10 p.m.
#7	2:30 p.m.
#8	3:50 p.m.
#9	5:10 p.m.

What are all of the times the bus will leave on Saturday?

Bus number 9 will leave at 5:10 p.m. on saturdays.

Explain how you found your answers, including how you used the patterns Callie remembered.

I remembered that there are no even-numbered busses on weekends so saturday was bus #9 and the pattern is add an 1:20 so I came up with 5:10 p.m..

Score Point: 0

This response demonstrates no understanding of the item being tested.

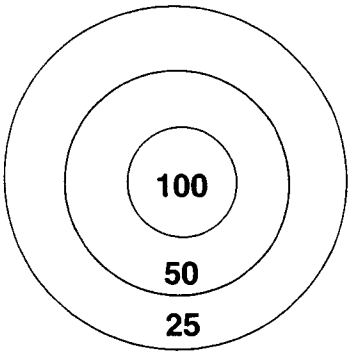
Item 38

38 Max is at the carnival. He wants to play the Ball Toss. When he tosses the ball, it will land in one of the numbered rings: 25, 50, or 100.

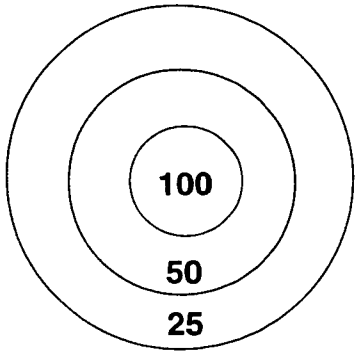
A In his first game, Max will toss 6 balls at the rings.

What is the lowest score he could get if the ball always lands in a numbered ring?

Explain your answer.



B In the second game, Max will toss 6 balls at the rings. To win, he needs to score exactly 400 points. Show how he could use 6 balls to score exactly 400 points. Show the six balls on the game board below by making an X where each ball lands.



Item 38: Scoring Rubric

MEAP Grade 4 Math 2002
Item # 38 Rubric

A student's score for item 38 is the sum of his or her scores in parts A and B.

Part A (maximum 2 points)

A **2-point** response to part A includes all of the following components:
- Determines the lowest score for all six balls landing in a ring is 150 points.
- Provides supporting work or explanation to indicate how 150 was determined.

A **1-point** response to part A includes one of the following components:
- Determines the lowest score for all six balls landing in a ring is 150 points.
- Indicates that the lowest score for one ball landing in a ring is 25 points and explains why this is so (explanation must address lowest **value**, not just lowest position or least area).

A **0-point** response to part A shows little or no understanding of part A.

Part B (maximum 2 points)

A **2-point** response to part B includes all of the following components:
- Student marks the answer space with 6 Xs that add to 400. (Each toss **must** be represented by an "X".)

Possible combinations are:

100-point Ring	50-point Ring	25-point Ring	Off Game Board
2	4	0	0
3	1	2	0
4	0	0	2

A **1-point** response to part B includes one of the following components:
- Student marks the answer space with 6 Xs that add to 350, 375, 425 or 450. (Each toss **must** be represented by an "X".)
- Student marks the answer space with fewer or more than 6 Xs that add to 400. (Each toss **must** be represented by an "X".)
- Student shows an alternate representation of 6 tosses that add to 400, e.g. tally marks, circles, a list, or a mathematical expression.

A **0-point** response to part B shows little or no understanding of part B.

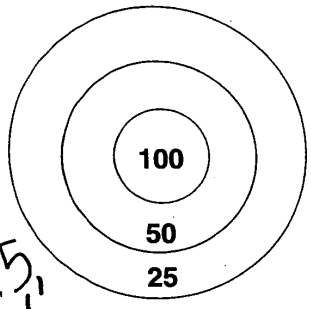
Item 38: Student Response 1

Max is at the carnival. He wants to play the Ball Toss. When he tosses the ball, it will land in one of the numbered rings: 25, 50, or 100.

A In his first game, Max will toss 6 balls at the rings.

What is the lowest score he could get if the ball always lands in a numbered ring?

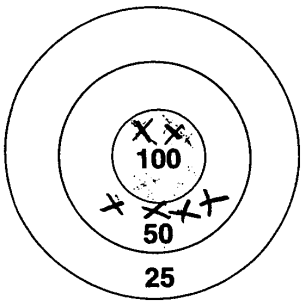
Explain your answer.



The lowest number on the number ring is 25, so if he got 25 each time he tossed the ball he would get 150, and 150 is the lowest score you can get.

B In the second game, Max will toss 6 balls at the rings. To win, he needs to score exactly 400 points. Show how he could use 6 balls to score exactly 400 points. Show the six balls on the game board below by making an X where each ball lands.

100
+100
200
+ 50
+ 50
300
+ 50
+ 50
400



Score Point: 4

Part A: This response correctly determines the lowest score possible (150) with the supporting work (he got 25 each time). (2 pts.)

Part B: This response correctly includes 6X's on the game board = 400. (2 pts.)

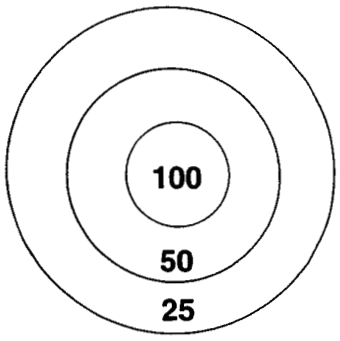
Item 38: Student Response 2

Max is at the carnival. He wants to play the Ball Toss. When he tosses the ball, it will land in one of the numbered rings: 25, 50, or 100.

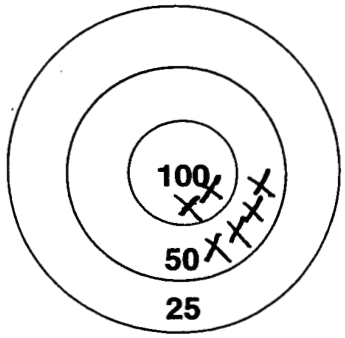
A In his first game, Max will toss 6 balls at the rings.

What is the lowest score he could get if the ball always lands in a numbered ring?

Explain your answer: 150 because I just added 25, 6 timesand got 150.



B In the second game, Max will toss 6 balls at the rings. To win, he needs to score exactly 400 points. Show how he could use 6 balls to score exactly 400 points. Show the six balls on the game board below by making an X where each ball lands.



200
200
300
350
350

50
50
50
50
200
100
100

- See note above

Score Point: 4

Part A: This response correctly determines the lowest score possible (150) with supporting work (adding 25, 6 times). (2 pts.)

Part B: This response correctly includes 6 X's on game board = 400. (2 pts.)

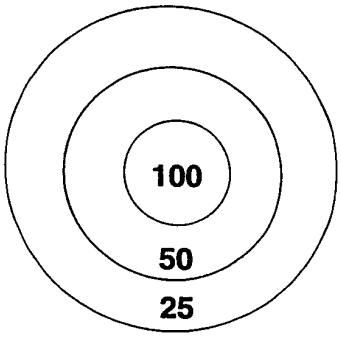
Item 38: Student Response 3

Max is at the carnival. He wants to play the Ball Toss. When he tosses the ball, it will land in one of the numbered rings: 25, 50, or 100.

A In his first game, Max will toss 6 balls at the rings.

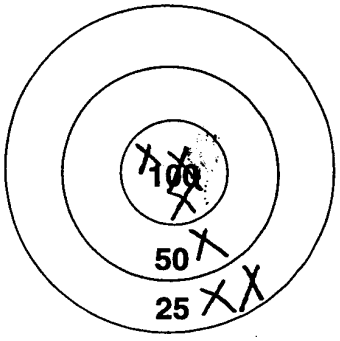
What is the lowest score he could get if the ball always lands in a numbered ring?

Explain your answer.



25, because 25 x 6 doesn't equal the highest score he could get.

B In the second game, Max will toss 6 balls at the rings. To win, he needs to score exactly 400 points. Show how he could use 6 balls to score exactly 400 points. Show the six balls on the game board below by making an X where each ball lands.



Score Point: 3

Part A: This response includes supporting work for the correct answer but does not indicate the lowest score possible. (1 pt.)

Part B: This response correctly includes 6 X's on game board that add to 400. (2 pts.)

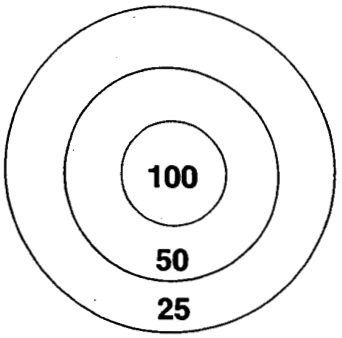
Item 38: Student Response 4

Max is at the carnival. He wants to play the Ball Toss. When he tosses the ball, it will land in one of the numbered rings: 25, 50, or 100.

A In his first game, Max will toss 6 balls at the rings.

What is the lowest score he could get if the ball always lands in a numbered ring?

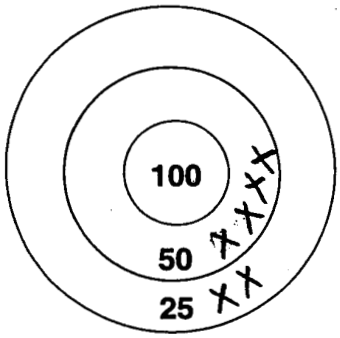
Explain your answer.



The lowest number ring is 25.
And he through the ball six times so I did 6 x 25 and got 150.

$$\begin{array}{r} 25 \\ \times\ 6 \\ \hline 150 \end{array}$$

B In the second game, Max will toss 6 balls at the rings. To win, he needs to score exactly 400 points. Show how he could use 6 balls to score exactly 400 points. Show the six balls on the game board below by making an X where each ball lands.



Score Point: 2

Part A: This response correctly determines the lowest score possible (150) with supporting work (multiplying 25, 6 times). (2 pts.)

Part B: This response incorrectly includes 6 X's which add to 250. (0 pts.)

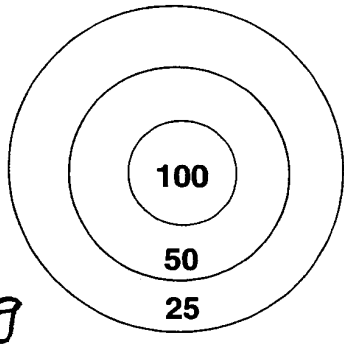
Item 38: Student Response 5

Max is at the carnival. He wants to play the Ball Toss. When he tosses the ball, it will land in one of the numbered rings: 25, 50, or 100.

A In his first game, Max will toss 6 balls at the rings.

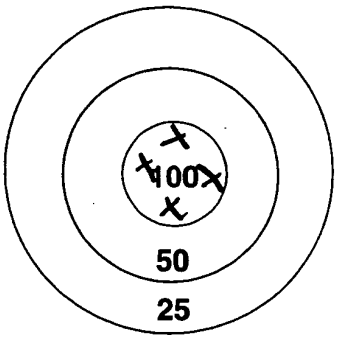
What is the lowest score he could get if the ball always lands in a numbered ring?

Explain your answer.



25 becaus 25 is the big circle 50 & 100 are the litteral circles inside of the big 25.

B In the second game, Max will toss 6 balls at the rings. To win, he needs to score exactly 400 points. Show how he could use 6 balls to score exactly 400 points. Show the six balls on the game board below by making an X where each ball lands.



Score Point: 1

Part A: This response demonstrates no understanding of how to determine the lowest score possible (explains 25 as the smallest area instead of value). (0 pts.)

Part B: This response includes fewer than 6 X's that add to 400. (1 pt.)

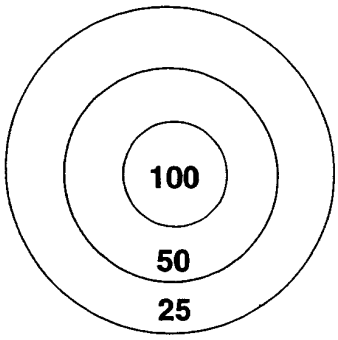
Item 38: Student Response 6

Max is at the carnival. He wants to play the Ball Toss. When he tosses the ball, it will land in one of the numbered rings: 25, 50, or 100.

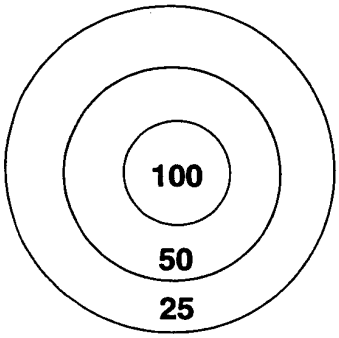
A In his first game, Max will toss 6 balls at the rings.

What is the lowest score he could get if the ball always lands in a numbered ring?

Explain your answer. 6x50+50=400



B In the second game, Max will toss 6 balls at the rings. To win, he needs to score exactly 400 points. Show how he could use 6 balls to score exactly 400 points. Show the six balls on the game board below by making an X where each ball lands.



Score Point: 0

Part A: This response demonstrates no understanding. (0 pts.)

Part B: No attempt is made to respond. (0 pts.)

Michigan Educational Assessment Program
Statewide Test Item Analysis
Mathematics Grade 4
Winter 2002

District: MICHIGAN DEPARTMENT OF TREASURY
School: STATEWIDE SCHOOL DATA
Codes: District- 99999 School- 0001
Run Date: 07/25/2002

Multiple Choice — Percent Answering by Response

Item No.	Benchmark Code	A	B	C	D	Omit/ Mult
Patterns, Relationships, and Functions						
02	1ES1	1	2	5	92*	0¤
04	2ES4	45*	11	31	13	1
05	1ES2	3	9	6	81*	0¤
08	1ES1	2	21	3	73*	0¤
11	1ES5	4	5	85*	5	0¤
15	2ES1	4	68*	6	21	0¤
34	1ES3	24	11	52*	13	1
Geometry and Measurement						
09	1ES5	10	8	27	54*	0¤
16	2ES2	61*	17	11	11	0¤
20	3ES1	4	3	4	90*	0¤
25	1ES2	21	9	21	49*	0¤
27	3ES2	9	8	32	50*	1
28	1ES3	4	5	17	74*	0¤
37	1ES3	77*	9*	2	11	1
Data Analysis and Statistics						
06	2ES1	4	70*	16	10	0¤
17	2ES1	8	5	81*	6	0¤
21	1ES2	93*	2	3	2	0¤
29	2ES1	1	3	87*	7	0¤
35	1ES3	14	61*	18	6	1
Number Sense and Numeration						
07	1ES2	7	11	52*	29	0¤
10	3ES3	5	12	5	79*	0¤
12	2ES4	7	7	66*	20	1
18	2ES1	3	5	16	76*	0¤
19	3ES2	64*	8	7	21	0¤
24	2ES3	5	89*	4	2	0¤
30	3ES5	48*	9	22	22	0¤
32	3ES5	9	56*	16	19	1
36	3ES1	12	7	7	73*	1
Numerical and Algebraic Operations and Analytical Thinking						
01	1ES1	10	3	77*	10	0¤
03	2ES4	16	6	48*	30	0¤
14	2ES4	13	60*	12	16	0¤
23	2ES2	5	85*	4	6	0¤
26	1ES4	84*	4	7	4	0¤
31	2ES3	18	56*	17*	9	1
Probability and Discrete Mathematics						
22	2ES4	49*	12	18	21	0¤
33	1ES1	77*	2	13	8	0¤

Number of Students Included: 126119

Constructed Response — Percent Receiving Number of Points / Percent Receiving Condition Codes

Item No.	Benchmark Code	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	A	B	C	D
Geometry and Measurement														
13	3ES6	37	7	10	4	12	2	8	2	17	0	0	0	2
Data Analysis and Statistics														
38	3ES5	8	3	11	3	15	4	19	3	34	0	0	0	1

Condition Codes for the Constructed-Response Items:

A	Off-task	C	Written in language other than English
B	Illegible	D	Blank/refused to respond

Using the Benchmark Codes

You can link the individual items to their corresponding benchmark in the *Michigan Curriculum Framework*, approved in 1996.

Each benchmark code contains four characters. The first character, an Arabic numeral, identifies the content standard under the specific strand. The next two characters represent the grade level column designation in the content standards documents (ES = Elementary School, MS = Middle School, and HS = High School). The number following these letters represents the specific benchmark in the column designated by the grade level.

EXAMPLE
An item with benchmark code 1MS2 under Geometry and Measurement is referring to content standard 1, Shape and Shape Relationships. Within that content standard, you need to look at middle school benchmark number 2, "generalize the characteristics of shapes and apply their generalizations to classes of shapes," to find the match.

CAUTION
Making inferences about students based on their answers to individual items is inadvisable due to the low reliability of single item measures. These data should only be used to make inferences about the performance of groups that are classroom size or larger.

Omit/Mult = Omits and Multiple Responses
¤ Number of students present rounds to zero